

REMARKS

Examination and allowance of pending Claims 1-36 are respectfully requested. Claim 13 has been withdrawn from consideration.

The Examiner rejected Claims 1-4, 6, 21, 22, 24, and 28 under 35 U.S.C. § 102(e) as being anticipated by Lagali et al (U.S. Patent 6,229,597 B1), hereinafter Lagali.

Lagali does not describe nor suggest ... a first row of M optical circuit stages, each of the M optical circuit stages being connected to an adjacent optical circuit stage by N parallel waveguides having substantially no curvature; and a second row of M optical circuit stages, each of the M optical circuit stages being connected to an adjacent optical circuit stage by N parallel waveguides having substantially no curvature, wherein the first row is coupled to the second row to form a multi-stage planar device, and N and M are integers *and wherein each of the M optical circuit stages is identical* as described in Applicant's currently amended base Claim 1. (emphasis added).

Lagali describes a balanced non-blocking switch by using symmetrical configurations of optically coupled interferometers. The Lagali arrangement as shown for instance in Lagali's **FIG. 3** does not describe each of the M optical circuit stages being identical. Lagali's first and last Stages 5h in **FIG. 3** each includes two 2X2 MMIs where the second Stage 5f includes two 4x4 MMIs. Applicant's M optical circuit stages are identical as shown in all Applicant's figures, for instance in Applicant's **FIG. 4** (elements 20, 22, 24, and 26).

Lagali does not describe or suggest having each of the M optical circuit stages being identical as recited in Applicant's currently amended Claim 1.

Accordingly, Applicant argues that each and every feature of the claim as arranged in the new claim is not taught by the cited prior art reference and that hence a *prima facie* case of anticipation has not been made.

For that reason, the rejection is improper and Applicant's Claim 1 is patentably distinct over the Lagali reference under 35 U.S.C. § 102(e).

Applicant's Claims 2-4 and 6, which depend from Claim 1, are also patentably distinct over the Lagali reference under 35 U.S.C. § 102(e) for reasons discussed above in conjunction with Claim 1. The Examiner states that independent method Claim 21 is also anticipated by Lagali. However, Applicant maintains similar arguments discussed above in conjunction with Claim 1 in that Lagali does not describe or suggest ... providing a planar device having a plurality of rows, each of the plurality of rows having M optical circuit stages, each of the M optical circuit stages being connected to an adjacent optical circuit stage by N parallel waveguides having substantially no curvature, wherein N and M are integers, and *wherein each of the M optical circuit stages is identical*, separating the planar device into a plurality of discrete components, wherein each discrete component includes a row of the plurality of rows; and coupling the plurality of discrete components to form a multi-stage planar device...as recited in Applicant's currently amended base Claim 21. (emphasis added).

Additionally, applying the rationale above, Applicant contends that Claim 21 and Claims 22, 24, and 28, which depend from Claim 21, directly and indirectly respectively, are also not anticipated by the Lagali reference.

Accordingly, the rejection under 35 U.S.C. § 102(e) is improper and should be removed.

The Examiner rejected Applicant's Claims 5, 14 and 29-36 under 35 U.S.C. § 103(a) as being unpatentable over Lagali.

Lagali does not describe or suggest ... wherein the switching device includes an Y-digital optical switch ... and wherein the first row is connected to the second row by optical fibers as recited in Applicant's dependent Claims 5 and 14, respectively. The Examiner submits that Lagali does not disclose the switching device including an Y-digital optical switch nor optical fibers connecting the first and second row. In addition, Applicant maintains the arguments above made in accord with base Claim 1, from which Claims 5 and 14 depend from, and accordingly asserts that Claims 5 and 14 are also patentably distinct over the cited reference.

Lagali does not describe or suggest providing a substrate and disposing a matrix of optical circuit stages on the substrate, each of the optical circuit stages being connected to an adjacent optical circuit stage by N parallel waveguides extending in a first direction to form at least one row of M optical circuit stages, wherein the parallel waveguides have substantially no curvature, and N and M are integers *and wherein each of the M optical circuit stages is identical...* as recited in Applicant's currently amended base Claim 29. Lagali does not disclose that the method comprises the step of providing a substrate nor does Lagali comprise identical M optical circuit stages. Accordingly, and as articulated in the line of reasoning presented above with respect to base Claims 1 and 21, base Claim 29 and dependent Claims 30-36 are patentably distinct over the Lagali reference.

Hence, Applicant's Claims 5, 14 and 29-36 are also patentably distinct over the Lagali reference under 35 U.S.C. § 103(a).

The Examiner rejected Applicant's Claims 7-12 under 35 U.S.C. § 103(a) as being unpatentable over Lagali in view of Edwards et al. (US Patent No. 6,404,942 B1), hereinafter Edwards.

Lagali neither describes nor suggests, whether taken together or separately from Edwards, ... wherein each optical circuit unit includes a MEMS device, ... (as recited in Applicant's Claim 7) a thermo-optical actuator (as recited in Applicant's Claim 8) ... a mechanical actuator (as recited in Applicant's Claim 9) ... an electro-optical actuator (as recited in Applicant's Claim 10) ... an electrostatic actuator (as recited in Applicant's Claim 11) ... a magnetic actuator (as recited in Applicant's Claim 12). The Examiner submits that the Lagali reference does not disclose any of the above recited elements. Motivation to add an Edwards MEMS device or actuators is not suggested by Lagali. In addition, Applicant's maintain the arguments above made in accord with base Claim 1, from which Claims 7-12 indirectly depend from, and accordingly assert that Claims 7-12 are also patentably distinct over the three cited references.

The Examiner rejected Applicant's dependent Claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Lagali in view of Kuroyanagi et al. (US Patent No. 6,154,583).

Applicant asserts that Lagali does not describe or suggest, taken together or separately from the Kuroyanagi reference, the first row is connected to the second row by a chip-to-chip connection ... as recited in Applicant's Claim 15, which depends from Claim 1. The Examiner submits that Lagali does not disclose the first row connected to the second row by a chip-to-chip connection. Motivation to provide such a connection is not suggested by Lagali. Accordingly and for reasons discussed above in association with base Claim 1 from which

Claim 15 directly depends, Applicant's Claim 15 is patentably distinct over the cited references.

The Examiner rejected Applicant's dependent Claim 16-17 under 35 U.S.C. § 103(a) as being unpatentable over Lagali and Kuroyanagi in view of Douglass (US Patent No. 5,786,979) and Claim 18 as being unpatentable over Lagali and Kuroyanagi in view of Dannoux et al. (US Patent No. 5,447,585).

Applicant argues that Lagali does not describe or suggest, taken together or separately with Kuroyanagi and/or Douglass ... the chip-to-chip connection includes a laser weld ... as recited in Claim 16 nor ... the chip-to-chip connection includes an adhesive as recited in Claim 17. The Examiner submits that neither Lagali nor Kuroyanagi disclose a chip-to-chip connection including a laser weld or adhesive. Douglass discloses an optical device connection having an adhesive however, no motivation to add a Douglass type adhesive is not suggested by Lagali nor Kuroyanagi and nowhere is it described or suggested to use a laser weld. Accordingly and for reasons discussed above in tandem with Applicant's base Claim 1 from which Claims 16-17 indirectly depend from, Applicant's Claims 16-17 are patentably distinct over the cited references.

Applicant contends that Lagali does not describe or suggest, taken together or separately from the Kuroyanagi and/or Douglass et al references, ... the chip-to-chip connection is implemented using a mass pigtailling technique... as recited in Applicant's Claim 18.

The Examiner submits that neither Lagali nor Kuroyanagi disclose a chip-to-chip connection implemented using a mass pigtailling technique as recited in Applicant's Claim 18. The Examiner states that Dannoux's abstract discloses such a mass pigtailling technique. However, Applicant claims that the motivation

to add a Dannoux mass pigtailling technique is not described or suggested by Kuroyanagi or Madsen. Accordingly and for reasons discussed above in tandem with Applicant's base Claim 1 from which Claim 18 indirectly depends from, Applicant's Claim 18 is patentably distinct over the cited references.

The Examiner rejected Applicant's Claims 19-20 under 35 U.S.C. § 103(a) as being unpatentable over Lagali and Kuroyanagi in view of Graves (US Patent No. 6,366,716 B1). The Examiner submits that the Lagali and Kuroyanagi references do not disclose the chip-to-chip connection includes aligning and mounting the first row and second row on an alignment substrate ... as recited in Applicant's Claim 19 nor the index-matching material disposed between the first row and the second row ... as recited in Applicant's Claim 20. Applicant argues that there is no motivation to combine these references and that furthermore Claims 19 and 20 are patentably distinct for reasons discussed above in conjunction with Claims 1 and 21.

Accordingly, Applicant's Claims 19 and 20 are patentable under 35 U.S.C. § 103(a) over the cited references.

The Examiner rejected Applicant's dependent Claim 25-26 under 35 U.S.C. § 103(a) as being unpatentable over Lagali in view of Douglass (US Patent No. 5,786,979). As articulated in the line of reasoning presented above along with Applicant's Claim 16-17, Applicant's Claims 25-26 are also patentably distinct over the cited references.

Lagali does not describe nor suggest, whether taken together or separately from Graves et al. (US Patent Number 6,366,716 B1)... the step of coupling includes disposing index-matching material between adjacent components... as recited in Applicant's method Claim 27. The Examiner submits

that the use of a substrate and the use of an index-matching material disposed between adjacent components is not disclosed nor contemplated by the Lagali reference. Motivation to combine a Graves index-matching material between optical components is not found in Lagali and furthermore for reasons discussed in conjunction with base Claims 1 and 21, the latter from which Claim 27 indirectly depends from, Claim 27 is patentable.

Accordingly, Applicant's dependent Claim 27 is also patentably distinct under 35 U.S.C. § 103(a) over Lagali and Graves and the rejection should be removed.

CONCLUSION

Based upon the above amendments, remarks and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentably distinct over the prior art of record. Applicant respectfully requests reconsideration of the pending claims and a prompt Notice of Allowance thereon.

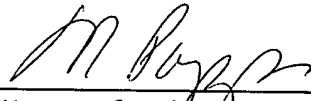
Applicant believes that a **no** extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. 1.136(a) as necessary to make this Reply timely and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Joanne Pappas at (978) 635-2289.

Respectfully submitted,

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